

Remarks

Claims 1-3, 5-15, and 17-23 are pending for the Examiner's consideration. Claims 5, 6, and 18 have been amended. No new matter is believed to have been added by the amendments presented herein.

Claims 5-8 and 18 were rejected in the Office Action under 35 U.S.C. § 112, second paragraph as having insufficient antecedent basis. In response, claims 5 and 6 have been amended to depend from claim 1 and claim 18 has been amended to depend from claim 14. Thus, the rejection respectfully is overcome.

In the Office Action, claims 1-3, 6-9, 11-12, 14, 15, and 18-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over WO 00/11324 to Bangert *et al.* ("Bangert") in view of U.S. Patent No. 3,631,672 to Gentile *et al.* ("Gentile"). The rejection respectfully is traversed.

The Office Action states that "Gentile discloses the use of ejectors (18) in a turbine case cooling system in order to provide a great amount of cooling air flow for a correspondingly small amount of motive fluid." (Office Action, pages 3-4). The Office Action further states that "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the cooling device of Bangert by including ejectors as taught by Gentile in order to provide a large cooling flow for a correspondingly small amount of motive fluid." (*Id.*). Applicants respectfully disagree.

Gentile is directed to an *eductor* cooled gas turbine casing. In particular, Gentile discloses that "pressurized fluid is directed to chamber 9 or ring manifold 32 from where it flows through eductor tube 18." (Gentile, Col. 4, lines 5-7).

Independent claim 1 recites, *inter alia*, at least one ejector that is operable with a motive fluid.

Independent claim 14 recites, *inter alia*, forcing a flow through the cavity at standstill of the turbomachine by a motive fluid emerging from at least one ejector, the flow being tangentially oriented at least with one velocity component.

Independent claim 22 recites, *inter alia*, at least one ejector for inducing and maintaining a forced flow with at least a tangentially oriented velocity component, the at least one ejector being arranged inside the cavity and being operable with a motive fluid.

Independent claim 23 recites, *inter alia*, at least one ejector for inducing and maintaining a forced flow with at least a tangentially oriented velocity component, the at least one ejector being arranged inside the cavity.

Applicants submit that the use of an eductor in the gas turbine casing of Gentile is very different from the use of at least one ejector as required by claims 1-3, 6-9, 11-12, 14, 15, and 18-23. The specification for example explains:

In a preferred embodiment of the invention, the cavity is provided with an extraction point which is connected to the ejector via a blower which can be arranged outside the region of high thermal loading. This blower delivers a motive fluid in a closed circuit from the extraction point to the ejector. The temperature gradient of a turbine casing can therefore be markedly reduced, which also improves the safety and reliability of a warm start possibly to be realized.

(Specification, Page 3, lines 12-17). The specification further explains, for example:

In a further preferred embodiment of the invention, an ejector is arranged at a point of the cavity which is situated at the furthest top or bottom geodetic level, whereas the extraction point connected to this ejector is arranged at point of the cavity which is situated at an opposite level, that is to say at the furthest top or furthest bottom level. In this way, the difference in density between the motive fluid issuing from the ejector and the medium in the cavity is at a maximum at the issuing point in such a way that the natural convection acts in an assisting manner and contributes in a certain manner to self-regulation of the temperature distribution: as soon as a thermal stratification of a few degrees occurs, the drive force of the ejector is intensified by the differences in density. If, conversely, the temperature is made more uniform, the intensification is slight or disappears entirely.

(Specification, Page 3, lines 18-28; emphasis added). There is no motivation or suggestion to combine the turbine housing of Bangert with the use of an eductor as in Gentile to arrive at the inventions of claims 1-3, 6-9, 11-12, 14, 15, and 18-23. These pending claims require at least one ejector. Further, as understood, Gentile's use of an eductor tube simply does not achieve the temperature distribution provided by the inventions of these claims.

The Office Action states that “[i]n regard to claims 14, 15, 18-21 and 23, the method of operating a turbo machine would have been apparent from the modified invention of Bangert.” However, the Office Action does not provide any further information on this statement such as a section of the Patent Code for a rejection or any argument.

In the Office Action, claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Bangert in view of Gentile. The Office Action states that “the

specification is silent as to any additional benefit of multiple ejectors arranged as claimed.” (Office Action, Page 4). Applicants again respectfully disagree and draw the Examiner’s attention to Page 7, line 21 to Page 8, line 12 which states, for example:

In an axial position, two ejectors 16, 26 oriented in the same blowout direction - counterclockwise in the example - are arranged at the circumference, a first ejector 16 being arranged at point of a cavity 2, 7 situated at the lowest geodetic level and a second ejector 26 being arranged at a point of a cavity 2, 7 situated at the highest geodetic level. A blower 14 is connected on the pressure side to the first ejector 16 and delivers its motive fluid 17 to the ejector 16 from an extraction point 15 situated upstream of the second ejector 26 relative to the blowout direction of the ejectors. A second blower 24 is connected on the pressure side to the second ejector 26 and delivers its motive fluid 27 to the ejector 26 from an extraction point 25 situated upstream of the first ejector 16 relative to the blowout direction of the ejectors. The motive-fluid flows 17, 27 flowing out counterclockwise excite a flow 18 through the cavity, this flow 18 being oriented in the same direction of rotation. The ejectors or their motive-fluid flow are/is to be designed in such a way that the velocity of the circumferential flow 18 is within the range of about 8 m/s to 20 m/s. Furthermore, the arrangement of ejectors and extraction points, assigned to them, at geodetically opposite positions results in a type of self-regulation of the throughflow intensity: if a slight vertical thermal stratification occurs, warm motive fluid 17 is delivered from the extraction point 15 to a point lying geodetically at the bottom. A lifting force of the motive fluid 17 therefore additionally occurs in the right-hand casing half. At the same time, cold fluid is delivered from the extraction point 25 to the ejector 26 arranged at the top. As a result, a downward flow of the motive fluid 27 therefore occurs in the left-hand casing half. This natural convection of the motive fluid accordingly assists the excitation of the flow 18, and in fact all the more so, the greater a temperature difference is between the casing top half and the casing bottom part.

Thus, it is apparent that the invention of claim 5 does not amount to “an obvious duplication of parts” as alleged in the Office Action on page 4 thereof at least because of the advantageous use of two ejectors oriented in the same blowout direction such as described above.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Bangert in view of Gentile and further in view of DE 507 129, and claims 10, 13, and 17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bangert in view of Gentile and further in view of U.S. Patent No. 5,782,076 to Huber *et al.* It is submitted that dependent claims 7, 10, 13, and 17 at least are patentable not only because of the patentability of the independent claim from which they depend, but also for the totality of features recited respectively therein.

In view of the foregoing, it is believed that all the pending claims are in condition for allowance, which is respectfully requested. If the Examiner does not agree, then a personal or telephonic interview is respectfully requested to discuss any remaining issues so as to expedite the eventual allowance of the claims.

A Petition for Extension of Time is submitted concurrently herewith. Should any additional fees be required, please charge any such fees to Steptoe & Johnson LLP Deposit Account No. 19-4293.

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Respectfully Submitted,



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Enclosures